



Office of Research and Development
National Health and Environmental Effects Research Laboratory
Mid-Continent Ecology Division (MED)

STEVEN PAUL BRADBURY

U.S. Environmental Protection Agency
National Health and Environmental Effects Research Laboratory
Mid-Continent Ecology Division - Duluth
6201 Congdon Boulevard
Duluth, MN 55804
218-529-5010
bradbury.steven@epa.gov

(revised 02/20/02)

EDUCATION

<u>Degree</u>	<u>Year</u>	<u>Major</u>	<u>Institution</u>
Ph.D.	1985	Toxicology and Entomology (Insecticide Toxicology)	Iowa State University, Ames, Iowa
M.S.	1981	Entomology (Insecticide Toxicology)	Iowa State University, Ames, Iowa
B.S.	1978	Molecular Biology (with honors)	University of Wisconsin-Madison

EXPERIENCE

Director, Mid-Continent Ecology Division

<u>Dates</u>	<u>Employer</u>
March 1999 - Present	U.S. Environmental Protection Agency Mid-Continent Ecology Division Duluth, MN 55804

Brief Description of Position: Lead and manage the Mid-Continent Ecology Division, which is comprised of 104 Federal staff at sites in Duluth, MN, and Grosse Ile, MI. Plan, direct, develop, and implement national research, development, and demonstration programs that advance the Division's mission to improve understanding of the effects of pollutants and polluting activities on freshwater ecological resources. Research is designed to improve monitoring and assessment techniques, reduce uncertainties in ecological risk assessments, and inform remediation and restoration planning. Establish organizational structure of the Division, establish overall Division priorities, integrate efforts with other U.S. EPA Office of Research and Development Divisions, develop management procedures, allocate financial and human resources, and coordinate and review all Division conducted and directed activities.

Chief, Ecological Toxicology Research Branch

Dates

Employer

May 1998 - March 1999

U.S. Environmental Protection Agency
Mid-Continent Ecology Division
Duluth, MN 55804

Brief Description of Position and Research Interests: Managed a research program addressing reproductive and development effects of xenobiotics on aquatic life and wildlife and the interactive effects of chemical and non-chemical stressors on aquatic life. Led a research project on the development of quantitative structure activity relationships. Assessed *in vivo* and *in vitro* neurological, physiological, and biochemical responses of fish to industrial organic compounds and pesticides to define structural characteristics for determining mechanisms of toxic action. Studied the *in vitro* and *in vivo* metabolism and toxicokinetics of xenobiotics in fish and wildlife for application in predictive models. Provided expert assistance to U.S. EPA Program and Regional Offices on issues related to ecological risk assessments of chemical pollutants; member U.S. EPA Risk Assessment Forum. Concurrently, adjunct appointment, Toxicology Degree Program, Graduate School, University of Minnesota.

ORD Regional Scientist, Region VIII (One-Year Rotational Appointment)

Dates

Employer

May 1997 - May 1998

U.S. Environmental Protection Agency
ORD Office of Science Policy
Region VIII
999 18th Street, Suite 500
Denver, CO 80202

Brief Description of Position and Research Interests: Responsible for integrating scientific needs of the Region with on-going and planned research within the Office of Research and Development. Areas of particular emphasis included response assessments of aquatic ecosystems, and associated riparian zones, to ecological stresses; remediation and pollution prevention strategies to reduce human health and ecological risks associated with hard rock mining; and wildlife risk assessments. In addition, research addressed the development of mechanistically-based quantitative structure activity relationships through the integration of experimental studies with computational chemistry modeling, in collaboration with staff of the National Health and Environmental Effects Research Laboratory.

Acting Associate Director for Science

Dates

Employer

1995 - 1997
1993 - 1994

U.S. Environmental Protection Agency
Mid-Continent Ecology Division
Duluth, MN 55804

Brief Description of Position and Research Interests: Responsible for technically directing a Division-level research program that addresses the prediction and assessment of pollutants and polluting activities on freshwater ecological resources. The program focused primarily on topics in environmental toxicology and freshwater ecology. Responsibilities included the development and integration of research teams within the Division, and other U.S. EPA facilities, and coordinating collaborative research activities with academic institutions and other federal agencies. Research addressed the development of mechanistically-based quantitative structure activity relationships through the integration of experimental studies with computational chemistry modeling. Concurrently, adjunct appointment, Toxicology Degree Program, Graduate School, University of Minnesota. Activities include teaching and serving on Ph.D. candidate committees.

Chief, Toxic Mechanisms Research Branch

<u>Dates</u>	<u>Employer</u>
1994 - 1995 1991 - 1993	U.S. Environmental Protection Agency Environmental Research Laboratory-Duluth 6201 Congdon Boulevard Duluth, MN 55804

Brief Description of Position and Research Interests: Led a research program addressing mode of toxic action, metabolism, and toxicokinetics of xenobiotics in aquatic organisms. Assessed *in vivo* and *in vitro* neurological, physiological, and biochemical responses of fish to industrial organic compounds and pesticides to define structural characteristics for determining mechanisms of toxic action. Results incorporated in the development of quantitative structure activity relationships. Studied the *in vitro* and *in vivo* metabolism and toxicokinetics of xenobiotics in fish and wildlife for application in predictive models. Provided expert assistance to U.S. EPA Program and Regional Offices on issues related to ecological risk assessments of chemical pollutants; member U.S. EPA Risk Assessment Forum. Concurrently, adjunct appointment, Toxicology Degree Program, Graduate School, University of Minnesota.

Research Toxicologist

<u>Dates</u>	<u>Employer</u>
1985 - 1991	U.S. Environmental Protection Agency Environmental Research Laboratory-Duluth 6201 Congdon Boulevard Duluth, MN 55804

Brief Description of Position and Research Interests: Studied the *in vivo* and *in vitro* physiological responses of fish to industrial organic compounds and pesticides to define structural characteristics for determining mechanisms of toxic action. Results were incorporated in the development of quantitative structure activity relationships. Studied the *in vitro* and *in vivo* metabolism and toxicokinetics of xenobiotics in fish and wildlife for application in predictive models; member U.S. EPA Risk Assessment Forum. Concurrently, adjunct appointment, Toxicology Degree program, Graduate School, University of Minnesota.

Predoctoral Research Associate

<u>Dates</u>	<u>Employer</u>
1984 - 1985	Department of Entomology Iowa State University

Brief Description of Position and Research Interests: Planning, technical supervision, and coordination of a U.S. EPA grant. Investigated the influence of chemical properties and toxicokinetics on the toxicity of a pyrethroid insecticide to fathead minnows. Participated in studies involving the uptake and metabolism of insecticides in black cutworms. Provided technical consultation to studies involving the degradation of organophosphorus insecticides in soil and stored grain, and the effects of natural products on insect species.

Graduate Research Assistant

<u>Dates</u>	<u>Employer</u>
1979 - 1984	Department of Entomology Iowa State University

Brief Description of Position and Research Interests: Planned and directed thesis and dissertation research, which involved the fate and effect of fenvalerate, a synthetic pyrethroid insecticide, in nontarget species. Determined the insecticide's acute oral and dietary toxicity in bobwhite quail and its lethality to fathead minnows. Examined the physiological response of rainbow trout to acute aqueous exposures. Determined the toxicokinetics and metabolic fate of fenvalerate in bobwhite quail and rainbow trout. Responsibilities included laboratory supervision and the procurement of funding.

Biological Technician

Dates

Employer

1978 - 1979

U.S. Fish and Wildlife Service
Patuxent Wildlife Research Center
Laurel, MD

Brief Description of Position and Research Interests: Requested and received a term appointment before beginning graduate school. Given partial responsibility in planning, conducting, analyzing, and publishing research involving avian cholinesterases and their *in vivo* response to sublethal exposures of organophosphorus insecticides.

PROFESSIONAL SOCIETIES

American Chemical Society (Agrochemical Division)
American Association for the Advancement of Science
Sigma Xi
Society of Toxicology
Society of Environmental Toxicology and Chemistry

PROFESSIONAL ACTIVITIES/APPOINTMENTS

Service

Member U.S. EPA Risk Assessment Forum (1991 - 1998)
ATSDR Steering Committee on Physiologically-Based Pharmacokinetic Models and Structure Activity Relationships (1994 - 1996)
Editorial Board, Australasian Journal of Ecotoxicology (1994 - Present)
Organizing and Scientific Committees for the 5th, 6th, 7th, and 9th International Workshops on QSARs in Environmental Sciences (1990 Duluth, MN; 1992 Ispra, Italy; 1996 Elsinore, Denmark; 2000 Bourgas, Bulgaria)
Scientific Advisory Committee, University of California-Davis, Center for Ecological Health Research (1998 - 2001)
Scientific Steering Committee and Session Co-Chair, U.S. EPA/DoI Workshop on Advances in Hardrock Mining Remediation Technology and Assessing and Prioritizing Aquatic Risk and Response, October, 1998, Denver, CO
Scientific Steering Committee, U.S. EPA Risk Assessment Forum/DoI/WHO Workshop on 2,3,7,8-TCDD TEFs for Aquatic Life and Wildlife, January 1998, Chicago, IL
Scientific Steering Committee, U.S. EPA/ATSDR/NIEHS/DoD Workshop on Sentinel Species, September 1997, Fredrick, MD
Scientific Steering Committee, Society of Environmental Toxicology and Chemistry-Europe, Workshop on Biotransformation in Environmental Risk Assessment, April 1996, Noordwijkerhout, The Netherlands
Co-Chair, U.S. EPA International Symposium on Structural Properties for Determining Mechanisms of Toxic Action, October 1988, Duluth, MN
Co-Chair, International Symposium on Aquatic Toxicology of the Pyrethroid Insecticides. National meeting of the Society of Environmental Toxicology and Chemistry, November 1986, Alexandria, VA
Session Co-Chair at Annual Society of Environmental Toxicology and Chemistry meetings (1996, 1991)
Society of Environmental Toxicology and Chemistry, Awards Committee Member (1985 - 1987)

Reviewer

American Society for Testing and Materials, Aquatic Toxicology and Hazard Assessment Symposium Series Aquatic Toxicology
Environmental Science and Technology
Environmental Toxicology and Chemistry
National Institutes of Health, Biological Models and Materials Resources Program Study Section for "Development of Non-Mammalian Models for Biomedical Research" RFA
United Kingdom, Natural Environmental Research Council RFAs

AWARDS AND HONORS

Phi Kappa Phi
Gamma Sigma Delta
U.S. EPA Outstanding Performance Awards: 1998 - 1992; 1990 - 1986
U.S. EPA Scientific and Technological Achievement Award, Honorable Mention--Primary Aromatic Amine Metabolism and Toxicokinetics, 1993
U.S. EPA Scientific and Technological Achievement Award, Tier III: New methods for quantifying dose in toxicity studies using tritium-labeled chemicals following discovery of unknown reactions with [³H]TCDD, 2001
U.S. EPA Silver Medal--Final Great Lakes Water Quality Initiative, Wildlife Criteria, 1995
U.S. EPA Bronze Medal--2,3,7,8-TCDD Wildlife Risk Assessment for the Columbia River Basin TMDL, 1993
U.S. EPA Bronze Medal--Draft Great Lakes Water Quality Initiative, Wildlife Criteria, 1992
U.S. EPA Bronze Medal--Municipal Sludge Ecological Risk Assessment, 1992

GRANTS

U.S. Department of Defense, Strategic Environmental Research and Development Program: Ecotoxicology Database and Modeling Support System; 1993 - 1995 (\$1,300,000)
U.S. EPA Office of Research and Development Competitive Environmental Education Training Grant: Niibin Aazhogan - An environmental resource training program (with S. Linder); 1992 - 1995 (\$190,000)
U.S. EPA Office of Research and Development Competitive Innovative Research Grant: Free radical reactivity and oxidative stress: Implications for assessing the toxicological hazards of environmental pollutants (with K. Wallace); 1990 (\$50,000)
U.S. EPA Office of Research and Development Competitive Innovative Research Grant: Development of a noninvasive whole animal assay of neurotoxicity (with J. Coats); 1988 (\$50,000)
U.S. EPA Office of Research and Development Competitive Innovative Research Grant: Metabolism and tumor induction of primary aromatic amines in fish (with R. Johnson); 1987 (\$50,000)

PUBLICATIONS

Peer-Reviewed Journals

1. Bradbury S.P., C.L. Russom, G.T. Ankley, T.W. Schultz, and J.D. Walker. 2002. QSARs for predicting ecological effects of organic chemicals. *Environ. Toxicol. Chem.* (submitted).
2. Russom C.L., R. Breton, J.D. Walker, and S.P. Bradbury. 2002. QSARs for screening and prioritizing chemicals. *Environ. Toxicol. Chem.* (submitted).
3. Schmieder P.K., G.T. Ankley, O.G. Mekenyan, J.D. Walker, and S.P. Bradbury. 2002. QSAR models for predicting ER binding affinity of structurally diverse chemicals. *Environ. Toxicol. Chem.* (submitted).
4. Herbrandson, C., S.P. Bradbury, and D.L. Swackhammer. 2002. Synergistic effects of suspended solids and carbofuran on *Daphnia magna* survival: An evaluation of food availability and particle characteristics. *Aquat. Toxicol.* (submitted).

5. Herbrandson, C., S.P. Bradbury, and D.L. Swackhammer. 2002. Synergism between carbofuran and suspended solids in acute toxicity to *Daphnia magna*. *Aquat. Toxicol.* (submitted).
6. Ankley, G.T., O.G. Mekenyan, V.B. Kamenska, P.K. Schmieder, and S.P. Bradbury. 2002. Reactivity profiles of ligands of mammalian retinoic acid receptors: A preliminary COREPA analysis. *SAR QSAR Environ. Res.* (in press).
7. Mekenyan, O.G., V. Kamenska, E. Marafante, P.K. Schmieder, G.T. Ankley, and S.P. Bradbury. 2000. A computationally-based identification algorithm for potential estrogen-receptor ligands. Part II. An evaluation of a hERa binding affinity model. *Toxicol. Sci.* 58:270-281.
8. Bradbury, S.P., V. Kamenska, P.K. Schmieder, G.T. Ankley, and O.G. Mekenyan. 2000. A computationally-based identification algorithm for potential estrogen-receptor ligands. Part I. Predicting hERa binding affinity. *Toxicol. Sci.* 58:253-269.
9. Herbrandson, C., S.P. Bradbury, and D.L. Swackhammer. 1999. New testing apparatus for assessing interactive effects of suspended solids and chemical stressors on plankton invertebrates. *Environ. Toxicol. Chem.* 18:679-684.
10. Fernandez, J.D., B.C. Butterworth, P.M. Cook, and S.P. Bradbury. 1999. Temporal changes in purity and specific activity of tritium-labeled 2,3,7,8-tetrachlorodibenzo-*p*-dioxin: Radiopurity model for toxicology. *Environ. Sci. Tech.* 33:3558-3567.
11. Nichols, J.W., S.P. Bradbury, and J. Swartout. 1999. Derivation of wildlife values for mercury. *J. Toxicol. Environ. Health, Part B* 2:235-355.
12. Mekenyan, O.G., N. Nikolova, S. Karabunarliev, S.P. Bradbury, G.T. Ankley, and B. Hansen. 1999. New advances in a hazard identification algorithm for hormone receptor ligands. *Quant. Struct.-Act. Relat.* 18:139-153.
13. Kolanczyk, R.C., P.K. Schmieder, S.P. Bradbury, and T. Spizzo. 1999. Pathway and rate of 4-methoxyphenol biotransformation in microsomes of rainbow trout (*Oncorhynchus mykiss*) hepatic microsomes. *Aquat. Toxicol.* 45:47-61.
14. Ivanov, J.M., O.G. Mekenyan, S.P. Bradbury, and G. Shuurman. 1998. A kinetic analysis of the conformational flexibility of steroid hormones. *Quant. Struct.-Act. Relat.* 17:437-449.
15. Carlson, R.W., S.P. Bradbury, R.A. Drummond, and D.E. Hammermeister. 1998. Neurological effects on startle response and escape from predation by larval medaka (*Oryzias latipes*) exposed to organic chemicals. *Aquat. Toxicol.* 43:51-68.
16. Basak, S.C., G.D. Grunwald, G.E. Host, G.J. Niemi, and S.P. Bradbury. 1998. A comparative study of molecular similarity, statistical, and neural methods for predicting toxic modes of action. *Environ. Toxicol. Chem.* 17:1056-1064.
17. Bradbury, S.P., O.G. Mekenyan, and G.T. Ankley. 1998. The role of ligand flexibility in predicting biological activity: Structure-activity relationships for aryl hydrocarbon, estrogen, and androgen receptor binding affinity. *Environ. Toxicol. Chem.* 17:15-25.
18. Mekenyan, O.G., J.M. Ivanov, S. Karabunarliev, S.P. Bradbury, G.T. Ankley, and W. Karcher. 1997. A computationally-based hazard identification algorithm that incorporates ligand flexibility. I. Identification of potential androgen receptor ligands. *Environ. Sci. Technol.* 31:3702-3711.
19. Russom, C.L., S.P. Bradbury, S.J. Broderius, D.E. Hammermeister, and R. A. Drummond. 1997. Predicting modes of toxic action from chemical structure: Acute toxicity of industrial organic chemicals to the fathead minnow (*Pimephales promelas*). *Environ. Toxicol. Chem.* 16:948-967.

20. Rice, P.J., C.D. Drewes, T.M. Klubertanz, J.R. Coats, and S.P. Bradbury. 1997. Acute toxicity and behavioral effects of chlorpyrifos, permethrin, phenol, strychnine, and 2,4-dinitrophenol to 30-day Japanese medaka (*Oryzias latipes*). Environ. Toxicol. Chem. 16:696-704.
21. Bradbury, S.P., O.G. Mekenyan, and G.T. Ankley. 1996. Quantitative structure activity relationships for polychlorinated hydroxybiphenyl estrogen receptor binding affinity: An assessment of conformer flexibility. Environ. Toxicol. Chem. 15:1945-1954.
22. Mekenyan, O.G., S.P. Bradbury, and V.B. Kamenska. 1996. Estimating one-electron reduction potentials of quinones. SAR QSAR Environ. Res. 5:255-268.
23. Karabunarliev, S., O.G. Mekenyan, W. Karcher, C.L. Russom, and S.P. Bradbury. 1996. Quantum-chemical descriptors for estimating the acute toxicity of electrophiles to the fathead minnow (*Pimephales promelas*): An analysis based on molecular mechanisms. Quant. Struct.-Act. Relat. 15:311-320.
24. Karabunarliev, S., O.G. Mekenyan, W. Karcher, C.L. Russom, and S.P. Bradbury. 1996. Quantum-chemical descriptors for estimating the acute toxicity of substituted benzenes to the guppy (*Poecilia reticulata*) and fathead minnow (*Pimephales promelas*). Quant. Struct.-Act. Relat. 15:302-310.
25. Bradbury, S.P., O.G. Mekenyan, G.D. Veith, and N. Zaharieva. 1995. SAR models for futile metabolism: One-electron reduction of quinones, phenols, and nitrobenzenes. SAR QSAR Environ. Res. 4:109-124.
26. Russom, C.L., S.P. Bradbury, and A.R. Carlson. 1995. Use of knowledge bases and QSARs to estimate the relative ecological risk of agrichemicals: A problem formulation exercise. SAR QSAR Environ. Res. 4:83-95.
27. Bradbury, S.P. 1995. Quantitative structure activity relationships and ecological risk assessment: An overview of predictive aquatic toxicology research. Toxicol. Lett. 79:229-237.
28. Mekenyan, O.G., G.D. Veith, S.P. Bradbury, and N. Zaharieva. 1995. SAR models for metabolic activation: Stability of organic cation intermediates. Quant. Struct.-Act. Relat. 14:264-269.
29. Bradbury, S.P. 1995. Ecological risk assessment for chemical stressors: Challenges in predictive ecotoxicology research. Aust. J. Ecotoxicol. 1:3-9.
30. Mekenyan, O.G., J.M. Ivanov, G.D. Veith, and S.P. Bradbury. 1994. Dynamic QSAR: A new search for active conformations and significant stereoelectronic indices. Quant. Struct.-Act. Relat. 13:302-307.
31. Bradbury, S.P. 1994. Predicting modes of toxic action from chemical structure: An overview. SAR QSAR Environ. Res. 2:89-104.
32. Mekenyan, O.G., G.D. Veith, S.P. Bradbury, and C.L. Russom. 1993. Structure-toxicity relationships for α , β -unsaturated alcohols in fish. Quant. Struct.-Act. Relat. 12:132-136.
33. Bradbury, S.P., J.M. Dady, P.N. Fitzsimmons, M.M. Voit, D.E. Hammermeister, and R.J. Erickson. 1993. Toxicokinetics and metabolism of aniline and 4-chloroaniline in medaka (*Oryzias latipes*). Toxicol. Appl. Pharmacol. 118:205-214.
34. Dady, J.M., S.P. Bradbury, A.D. Hoffman, M. Voit, and D.L. Olson. 1991. Hepatic microsomal N-hydroxylation of aniline and 4-chloroaniline by rainbow trout (*Oncorhynchus mykiss*). Xenobiotica 21:1605-1620.
35. Bradbury, S.P. and G.M. Christensen. 1991. Inhibition of alcohol dehydrogenase activity by acetylenic and allylic alcohols: Concordance with *in vivo* electrophile reactivity in fish. Environ. Toxicol. Chem. 10:1155-1160.

36. Bradbury, S.P., R.W. Carlson, G.J. Niemi, and T.R. Henry. 1991. Use of respiratory-cardiovascular responses of rainbow trout (*Oncorhynchus mykiss*) in identifying acute toxicity syndromes in fish: Part 4. Central nervous system seizure agents. *Environ. Toxicol. Chem.* 10:115-131.
37. Hermens, J.L.M., S.P. Bradbury, and S.J. Broderius. 1990. Influence of cytochrome P-450 mixed function oxidase induction on the acute toxicity to rainbow trout (*Oncorhynchus mykiss*) of primary aromatic amines. *Ecotox. Environ. Saf.* 20:156-166.
38. Bradbury, S.P. and R.L. Lipnick. 1990. Introduction: Structural properties for determining mechanisms of toxic action. *Environ. Health Perspect.* 87:181-182.
39. Coats, J.R., D.M. Symonik, S.P. Bradbury, S.D. Dyer, L.K. Timson, and G.J. Atchison. 1989. Toxicology of synthetic pyrethroids in aquatic organisms: An overview. *Environ. Toxicol. Chem.* 8:671-679.
40. Dyer, S.D., J.R. Coats, S.P. Bradbury, G.J. Atchison, and J.M. Clark. 1989. Effects of hardness and salinity on the acute toxicity and uptake of fenvalerate by bluegill (*Lepomis macrochirus*). *Bull. Environ. Contam. Toxicol.* 42:349-366.
41. Bradbury, S.P. and J.R. Coats. 1989. Toxicokinetics and toxicodynamics of pyrethroid insecticides in fish. *Environ. Toxicol. Chem.* 8:373-380.
42. Bradbury, S.P., T.R. Henry, G.J. Niemi, R.W. Carlson, and V.M. Snarski. 1989. Use of respiratory-cardiovascular responses of rainbow trout (*Salmo gairdneri*) in identifying acute toxicity syndromes in fish. Part 3: Polar narcotics. *Environ. Toxicol. Chem.* 8:247-261.
43. Symonik, D.M., J.R. Coats, S.P. Bradbury, and G.J. Atchison. 1989. Effect of fenvalerate on metabolic dynamics in the fathead minnow (*Pimephales promelas*) and bluegill (*Lepomis macrochirus*). *Bull. Environ. Contam. Toxicol.* 42:821-828.
44. Bradbury, S.P. and J.R. Coats. 1988. Comparative toxicology of the pyrethroid insecticides. *Rev. Environ. Contam. Toxicol.* 108:133-177.
45. Bradbury, S.P., J.M. McKim, and J.R. Coats. 1987. Physiological response of rainbow trout (*Salmo gairdneri*) to acute fenvalerate intoxication. *Pestic. Biochem. Physiol.* 27:275-288.
46. McKim, J.M., S.P. Bradbury, and G.J. Niemi. 1987. Fish acute toxicity syndromes and their use in the QSAR approach to hazard assessment. *Environ. Health Perspect.* 71:171-186.
47. Bradbury, S.P., D.M. Symonik, J.R. Coats, and G.J. Atchison. 1987. Toxicity of fenvalerate and its constituent isomers to the fathead minnow (*Pimephales promelas*) and bluegill (*Lepomis macrochirus*). *Bull. Environ. Contam. Toxicol.* 38:727-735.
48. Bradbury, S.P., J.R. Coats, and J.M. McKim. 1986. Toxicokinetics of fenvalerate in rainbow trout (*Salmo gairdneri*). *Environ. Toxicol. Chem.* 5:567-576.
49. Bradbury, S.P., J.R. Coats, and J.M. McKim. 1985. Differential toxicity and uptake of two fenvalerate formulations in fathead minnows (*Pimephales promelas*). *Environ. Toxicol. Chem.* 4:533-541.
50. Bradbury, S.P. and J.R. Coats. 1982. Toxicity of fenvalerate to bobwhite quail (*Colinus virginianus*), including brain and liver residues associated with mortality. *J. Toxicol. Environ. Health* 10:307-319.
51. Fleming, S.J. and S.P. Bradbury. 1981. Recovery of cholinesterase in mallard ducklings administered organophosphorus pesticides. *J. Toxicol. Environ. Health* 8:885-897.

Peer-Reviewed Book Chapters/Symposium Proceedings

1. Bradbury, S.P., R.W. Carlson, and T.R. Henry. 1999. The nervous system. In: *The Toxicology of Fishes*. Di Giulio R. and Hinton D. (eds.). Taylor Francis, New York, NY. (submitted).
2. Fairbrother, A., G.T. Ankley, L.S. Birnbaum, S.P. Bradbury, B. Francis, L.E. Gray, D. Hinton, L.L. Johnson, R.E. Peterson, and G. Van Der Kraak. 1999. Reproductive and developmental toxicology of contaminants in oviparous animals. In: *Reproductive and Developmental Effects of Contaminants in Oviparous Vertebrates*. Di Giulio R.T. and Tillitt, D.E. (eds.). SETAC Press, Pensacola, FL. pp. 283-361.
3. Mekenyan, O.G., J.M. Ivanov, S. Karabunarliev, B. Hansen, G.T. Ankley, and S.P. Bradbury. 1998. A new approach for estimating three-dimensional similarity that incorporates molecular flexibility. In: *Proceedings of the 7th International Workshop on QSARs in Environmental Sciences*. Chen, F. and Schuurman, G. (eds.). SETAC Press, Pensacola, FL. pp. 39-57.
4. Ankley, G., S. P. Bradbury, J. Hermens, O. Mekenyan, and K.-E. Tollefsen. 1997. Current approaches to the use of structure activity relationships (SARs) in identifying the hazards of endocrine modulating chemicals to wildlife. In: *SETAC-Europe/OECD/EC Expert Workshop on Endocrine Modulators and Wildlife: Assessment and Testing*. Tattersfield, L., P. Mathiessen, P. Campbell, N. Grandy, and R. Lange (eds.). SETAC-Europe, Brussels, Belgium. pp. 19-40.
5. Ankley, G.T., R.D. Johnson, G. Toth, L.C. Folmar, N.E. Detenbeck, and S.P. Bradbury. 1997. Development of a research strategy for assessing the ecological risk of endocrine disruptors. *Reviews in Toxicology* 1:231-267.
6. Bradbury, S.P. 1996. 2, 3, 7, 8-Tetrachlorobenzo-p-dioxin. In: *Noninfectious Diseases of Wildlife*, 2nd edition. Fairbrother, A., I. Locke, and G.L. Hoff (eds.). University Press, Ames, IA. pp. 87-98.
7. Featherstone, D., C.D. Drewes, J.R. Coats, and S.P. Bradbury. 1993. A non-invasive neurotoxicity assay using larval medaka. In: *Environmental Toxicology and Risk Assessment: 2nd Volume*, ASTM STP 1216. Gorsuch, J.W., F.J. Dwyer, C.G. Ingersoll, and T.W. LaPoint (eds.). American Society for Testing and Materials, Philadelphia, PA. pp. 275-288.
8. Niemi, G.J., S.P. Bradbury, and J.M. McKim. 1991. The use of fish physiology literature for predicting fish acute toxicity syndromes. In: *Aquatic Toxicology and Hazard Assessment: 13th Volume*, ASTM STP 1124. Barron, M. and M. Mayes (eds.). American Society for Testing and Materials, Philadelphia, PA. pp. 245-260.
9. Bradbury, S.P. and R.L. Lipnick (eds.). 1990. Structural properties for determining mechanisms of toxic action. *Environ. Health Perspect.* 87:181-272.
10. Bradbury, S.P., T.R. Henry, and R.W. Carlson. 1990. Fish acute toxicity syndromes in the development of mechanism-specific QSARs. In: *Practical Applications of Quantitative Structure-Activity Relationships (QSAR) in Environmental Chemistry and Toxicology*. Karcher, W. and J. Devillers (eds.). Kluwer Academic Publishers, Dordrecht, The Netherlands. pp. 295-315.
11. Bradbury, S.P., R.W. Carlson, and T.R. Henry. 1989. Polar narcosis in aquatic organisms. In: *Aquatic Toxicology and Hazard Assessment: 12th Symposium*, ASTM STP 1027. Cowgill, U.M. and L.R. Williams (eds.). American Society for Testing and Materials, Philadelphia, PA. pp. 59-73.
12. Coats, J.R. and S.P. Bradbury (eds.). 1989. Aquatic toxicology of the pyrethroid insecticides. *Environ. Toxicol. Chem.* 8:359-429.
13. Bradbury, S.P. 1988. Fish acute toxicity syndromes: Application to the development of mechanism-specific QSARs. In: *Proceedings of the 3rd International Workshop on Quantitative Structure-Activity Relationships in Environmental Toxicology*. Turner, J.E., M.W. England, T.W. Schultz, and N.J. Kwaak (eds.). Department of Energy Publication No. CONF-880520 (DE88013180). pp. 61-70.

EPA Reports

1. U.S. EPA. 1995. *Great Lakes water quality initiative technical support document for wildlife criteria*. EPA/820/B-95/009, March 1995 (a lead author; document incorporated SAB review and public comment).
2. U.S. EPA. 1995. *Great Lakes water quality initiative criteria documents for the protection of wildlife: DDT, mercury, 2,3,7,8-TCDD, and PCBs*. EPA/820/B-95/008, March 1995 (a lead author; document incorporated public comment).
3. Cook, P.M., R.J. Erickson, R.L. Spehar, S.P. Bradbury, and G.T. Ankley. 1993. *Interim report on data and methods for assessment of 2,3,7,8-tetrachloro-p-dioxin risks to aquatic life and associated wildlife*. EPA/600/R-93/055, March 1993 (externally peer-reviewed).
4. Bradbury, S.P., G.D. Veith, and C.L. Russom. 1992. *Report on prototype expert system to predict toxic mechanism from chemical structure*. Deliverable No. 5658A. U.S. Environmental Protection Agency, Duluth, MN.
5. Bradbury, S.P. and P.N. Fitzsimmons. 1991. *Interim wildlife criteria: Assessment of screening level values*. U.S. Environmental Protection Agency, Duluth, MN (internal report).
6. Bradbury, S.P. 1990. *Validation of screening level wildlife criteria: A progress report*. U.S. Environmental Protection Agency, Duluth, MN (internal report).
7. Bradbury, S.P. and R.W. Carlson. 1990. *Predictive toxicology in risk assessment: Approaches in predicting mechanisms of toxic action*. Deliverable No. 7912A. U.S. Environmental Protection Agency, Duluth, MN.
8. Bradbury, S.P., P.N. Fitzsimmons, and E. Anderson. 1989. *Screening study for wildlife criteria development*. U.S. Environmental Protection Agency, Duluth, MN (internal report).
9. Bradbury, S.P., R. Hunter, and S.A.T. Hammermeister. 1988. *Expert system to predict major metabolites of industrial chemicals: A progress report*. EPA/600/D-88/298. U.S. Environmental Protection Agency, Duluth, MN (internal report).
10. Bradbury, S.P. 1986. *Report on SAR methods to predict major metabolites of industrial chemicals*. U.S. Environmental Protection Agency, Duluth, MN (internal report).

INVITED PRESENTATIONS/WORKSHOPS

1. A 3-D QSAR-based identification algorithm for potential estrogen receptor ligands. Eighth International Workshop on QSAR in Environmental Sciences, September, 16-21, 2000, Bourgas, Bulgaria.
2. Prioritization and ranking techniques for pesticides and industrial organic chemicals. Second Indo-US Workshop on Mathematical Chemistry, May, 2000, Duluth, MN.
3. Development of structure activity relationships for assessing ecological risks. 217th National Meeting of the American Chemical Society, Corwin Hansch Award Symposium, March 1999, Anaheim, CA.
4. United States Environmental Protection Agency Great Lakes Water Quality Initiative Wildlife Criteria. International Joint Commission, Great Lakes Science Advisory Board's Workgroup on Ecosystem Health Workshop on Great Lakes Water Quality Criteria, March 1998, Chicago, IL.
5. An overview of structure activity relationships in aquatic ecological risk assessments. National Science Foundation Workshop on Research Needs for Coastal Pollution, October 1997, Milwaukee, WI.

6. SETAC Foundation for Environmental Education/Pellston Conference. Reproductive and developmental effects of contaminants in oviparous vertebrates: Mechanisms, ecological consequences and assessments of risk. Workgroup member, July 1997, Gregson, MT.
7. Predictive models in environmental toxicology. Keynote address, Symposium on Predictive Methods in Toxicology and Environmental Toxicology. Sponsored by the University of Utrecht and the National Institute of Public Health and the Environment, May 1997, Utrecht, The Netherlands.
8. The evolution of ecological risk assessment: U.S. EPA proposed guidelines as a paradigm for opportunities. International Environmental Conference of the Paper and Related Industries, Canadian Pulp and Paper Association and USDA Forest Service, May 1997, Minneapolis, MN.
9. Society of Environmental Toxicology and Chemistry-Europe/Organization for Economic Cooperation and Development/European Commission, Expert Workshop on Endocrine Modulators and Wildlife Assessment and Testing, QSAR Workgroup Rapporteur, April 1997, Veldhoven, The Netherlands.
10. Identifying hazards of endocrine disruptors: A modeling framework. U.S. EPA Endocrine Disruptors Screening and Testing Advisory Committee, February 1997, Houston, TX.
11. Quantitative structure activity relationships and active analogue search techniques: An assessment of conformer flexibility. Seventeenth Annual Meeting of the Society of Environmental Toxicology and Chemistry, Special Symposium on Environmental Endocrine Disruptors, November 1996, Washington, DC.
12. Society of Environmental Toxicology and Chemistry-Europe, Workshop on Biotransformation in Environmental Risk Assessment, Steering committee member responsible for metabolic activation component, April 1996, Noordwijkerhout, The Netherlands.
13. Development of wildlife criteria in the Great Lakes Water Quality Initiative. Fourth Annual Meeting of the Midwest Chapter of the Society of Toxicology and Chemistry, April 1996, Duluth, MN.
14. Approaches and limitations in wildlife toxicity extrapolations. Second SETAC World Congress. Sixteenth Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 1995, Vancouver, BC, Canada.
15. Toxic equivalency methods for evaluating Ah receptor-mediated effects: Uncertainties in ecological risk assessments. Second SETAC World Congress, 16th Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 1995, Vancouver, BC, Canada.
16. Narcosis and toxicity mechanisms in aquatic organisms. Short-course on Mechanisms of Acute Toxicity: Baseline (or Minimum) Toxicity. Second SETAC World Congress, 16th Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 1995, Vancouver, BC, Canada.
17. QSARs for ecological effect assessments: Integrating ecotoxicology research with model development. Proctor and Gamble Environmental Science Seminar Series, September 1995, Cincinnati, OH.
18. QSAR approaches for assessing risk of endocrine disruptors. U.S. EPA Workshop on Ecological Effects of Endocrine Disruptors, June 1995, Duluth, MN.
19. Body burden assessments. California EPA Workshop on Guidelines for Ecotoxicological Risk Assessment, March 1995, Davis, CA.
20. QSAR applications for mixture assessments: Issues in predicting the toxicity of reacting chemicals. Sixth International Workshop on QSAR in Environmental Sciences, September 1994, Belgirate, North Italy.

21. SETAC Foundation for Environmental Education/Pellston Conference. Ecological Risk Assessment Modeling System. Taskgroup chair on ecological data needs, August 1994, Pellston, MI.
22. Experiences in QSAR and Ecological Risk Assessment. CSRIO, Division of Water Resources, July 1994, Griffith, NSW, Australia.
23. Predictive toxicology in ecological risk assessment. New South Wales EPA, Waters and Catchment Branch, June 1994, Sydney, NSW, Australia.
24. Ecological risk assessment for chemical stressors: Challenges in predictive ecotoxicology research. Keynote address, First Annual Conference of the Australasian Society for Ecotoxicology, June 1994, Sydney, NSW, Australia.
25. Ecological protection: The science. Council of State Governments and International City and County Management Association Ecological Protection Conference, April 1994, Chicago, IL.
26. Ecological effects of 2, 3, 7, 8-TCDD: An overview for aquatic life and associated wildlife. Ninth Annual U.S. EPA Regional Risk Assessment Conference, April 1994, Boston, MA.
27. Experiences in QSAR research and ecological hazard assessment. Decision Support Methodologies for Hazard Identification and Risk Assessment of Toxic Substances - A workshop sponsored by ASTDR, U.S. EPA, NCI, NIEHS, The National Library of Medicine, and Wright-Patterson Air Force Base, October 1993, Atlanta, GA.
28. The role of metabolic activation in modeling the toxicity of xenobiotics. Computational Chemistry Workshop, U.S. EPA National Environmental Supercomputing Center, September 1993, Bay City, MI.
29. Predicting modes of toxic action from chemical structure: An overview. Sixth International Workshop on QSAR in Environmental Toxicology, July 1992, Duluth, MN.
30. First order uncertainties in deriving wildlife criteria. National Wildlife Criteria Methodologies Meeting, April 1992, Charlottesville, VA.
31. Predictive toxicology in ecological risk assessment: Approaches in predicting mechanisms of toxic action from chemical structure. National meeting of the American Chemical Society, April 1991, Atlanta, GA.
32. Development of mechanism-specific QSARs: Application to ecological hazard assessments. Organization for Economic Co-operation and Development Workshop on Quantitative Structure Activity Relationships (QSAR) in Aquatic Effects Assessment, September 1990, Utrecht, The Netherlands.
33. Fish acute toxicity syndromes in the development of mechanism-specific QSARs. Practical applications of quantitative structure-activity relationships (QSAR) in environmental chemistry and toxicology. EURO - course series of the Commission of the European Communities, June 1990, Ispra, Italy.
34. Toxicokinetic and metabolic studies associated with the validation of medaka as a cancer model. Aquatic Models in Carcinogenicity Workshop, Chemical Manufacturers Association, January 1990, Washington, DC.
35. Fish acute toxicity syndromes: Application to the development of mechanism-specific QSARs. Third International Workshop on Quantitative Structure-Activity Relationships in Environmental Toxicology, May 1988, Knoxville, TN.
36. Polar narcosis in aquatic organisms. American Society for Testing and Materials Twelfth Symposium on Aquatic Toxicology and Hazard Assessment, April 1988, Las Vegas, NV.
37. Synthetic pyrethroids: Insecticides of the 80's. Iowa Pest Control Conference, January-February 1985, Ames, IA.

FIRST AUTHOR PRESENTATIONS (in addition to Invited Presentations)

1. New developments in a hazard identification algorithm for hormone receptor ligands. National meeting of the Society of Toxicology, March 1999, New Orleans, LA.
2. Incorporating conformational flexibility in structure activity relationships for ligand binding to steroid hormone receptors. National meeting of the Society of Environmental Toxicology and Chemistry, November 1997, San Francisco, CA.
3. Quantitative structure activity relationships for polychlorinated hydroxybiphenyl estrogen receptor binding affinity: An assessment of conformer flexibility. Seventh International Workshop on QSAR in Environmental Sciences, June 1996, Elsinore, Denmark (due to EPA travel restrictions presented by O. Mekenyan).
4. Quantitative structure activity relationships for polychlorinated hydroxybiphenyl estrogen receptor binding affinity. Fourth Annual meeting of the Midwest Chapter of the Society of Environmental Toxicology and Chemistry, April 1996, Duluth, MN.
5. Toxicokinetics and *in vivo* metabolism of aniline and 4-chloroaniline in medaka (*Oryzias latipes*). National meeting of the Society of Toxicology, March 1993, New Orleans, LA.
6. Development of screening-level values to identify and rank chemical hazards to wildlife. National meeting of the Society of Environmental Toxicology and Chemistry, November 1991, Seattle, WA.
7. Acetylenic and allylic alcohol reactivity, inhibition of alcohol dehydrogenase (ADH) activity and QSAR analyses for *in vivo* toxicity to fish. Twelfth annual meeting of the Society of Environmental Toxicology and Chemistry, November 1991, Seattle, WA.
8. Use of non-linear dynamic systems to predict toxic mechanisms from chemical structure. Fourth International Workshop on QSAR in Environmental Toxicology, September 1990, Veldhoven, The Netherlands.
9. Metabolism and toxicokinetic considerations in using fish as *in vivo* models for carcinogen assessments. Ninth annual meeting of the Society of Environmental Toxicology and Chemistry, November 1988, Crystal City, VA.
10. An expert system to predict the metabolism of environmental contaminants. National meeting of the Society of Environmental Toxicology and Chemistry, November 1988, Crystal City, VA.
11. Further assessment of rainbow trout respiratory-cardiovascular responses in identifying fish acute toxicity syndromes. National meeting of the Society of Environmental Toxicology and Chemistry, November 1987, Pensacola, FL.
12. Response of fish to pyrethroid intoxication. National meeting of the Society of Environmental Toxicology and Chemistry, November 1986, Alexandria, VA.
13. Toxicokinetics of fenvalerate in rainbow trout. National meeting of the Society of Environmental Toxicology and Chemistry, November 1985, St. Louis, MO.
14. Distribution and metabolic fate of fenvalerate in rainbow trout. National meeting of the American Chemical Society, September 1985, Chicago, IL.
15. Differential toxicity and uptake of two fenvalerate formulations in fathead minnows. National meeting of the Entomological Society of America, December 1984, San Antonio, TX.
16. Distribution of fenvalerate via two routes of entry into black cutworm. National meeting of the Entomological Society of America, November-December 1982, Toronto, Ontario.

17. Toxicity and metabolic fate of fenvalerate in bobwhite quail. National meeting of the American Chemical Society, September 1982, Kansas City, MO.

18. Excretion of tritium in bobwhite quail following the oral administration of radiolabeled fenvalerate. Meeting of the North Central Branch of the Entomological Society of America, March 1981, Columbus, OH.

CO-AUTHOR PRESENTATIONS

Over 50 paper and poster presentations at national and international scientific conferences from 1980 to 2000.